

**NUCLEAR MEDICINE**

**PAPER-II**

NM/D/18/24/II

Time: 3 hours  
Max. Marks:100

**Important Instructions:**

- Attempt all questions in order.
- Each question carries 10 marks.
- Read the question carefully and answer to the point neatly and legibly.
- Do not leave any blank pages between two answers.
- Indicate the question number correctly for the answer in the margin space.
- Answer all the parts of a single question together.
- Start the answer to a question on a fresh page or leave adequate space between two answers.
- Draw table/diagrams/flowcharts wherever appropriate.

**Write short notes on:**

1. Enumerate and elaborate on the different PET/CT imaging artefacts and methods to avoid/minimize them. 10
2. What are the quality control tests for a radiopharmaceutical and why are they needed for its preparation? 10
3. Different methods for radiolabeling red blood cells (RBC) and enumerate their advantages and disadvantages. 6+4
4. a) Factors involved in preparation of an ideal radiopharmaceutical. 5+5  
b) Describe in brief the different radiopharmaceuticals used for bone pain palliation.
5. a) F-18 fluorocholine and its clinical use. 5+5  
b) N-13 NH<sub>3</sub> and its clinical use.
6. a) F-18 FDG labeling of leukocyte. 5+5  
b) Perchlorate discharge test.
7. Describe about copper based radiopharmaceuticals used in imaging and therapy. 10
8. a) Different cyclotron produced radionuclides used for imaging. 5+5  
b) Operation modes of gas detectors with diagram.
9. a) Write in brief about any two positron emitting radionuclides produced by parent-daughter generator system with their physical characteristics and clinical applications. 5+5  
b) Thyroid uptake probe.
10. Describe FDG production methods and quality control procedure before its injection to the patients. 10

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